September 14, 2012

Comments on proposed draft rule R317-4 – Onsite Wastewater Systems

To facilitate review and importance of my comments I have organized them into two categories.

1- Program level comments
2- General comments on the draft rule

Program Level Comments:

Three comments are presented here with background and description of the issue and possible solution or alternative approach to the issue. The three program level comments are summarized as:

1. Roles and responsibilities clarification
2. Alternative systems program requirements
3. Embracing the potential advantages of the packed bed media systems

1. **Roles and responsibilities clarification.**

   I recommend that the rule language be clarified further regarding who does what work within the program. Specifically, that there be separation of roles in that there are testers, designers, installers, service providers, pumpers and regulators.

   Historically, the environmental health staff within the local health departments have performed many of the testing and designing roles while self regulating along the way. While this can work well and often times reduce expense to the property owner, there are examples I'm aware of where poor decisions have been made. Additionally, I'm aware of blanket approvals towards certified individuals with little to no regulatory oversight. This lack of oversight has also lead to poor decisions, ultimately putting the property owner at greater risk to have problems with their system.

   I believe that the best way to manage these risks is to have balance by separation of roles, ensuring check and balance within the program. The draft rule language really doesn't clarify whether or not the soil evaluation, site evaluation, percolation test, etc. are to be done by 'non-regulatory' individuals. It requires certification, but is vague regarding whether or not this person is in fact part of the regulatory agency. The language in the plan review section seems the clearest to define roles, but it's still open to interpretation especially, when considering the added vagueness in the other sections as summarized below.

   - The feasibility section R317-4-4 states: "The required information shall be prepared at the owner's expense by, or under the supervision of, a qualified person approved by the regulatory authority."

   - The plan review and permitting section R317-4-5 states "Plans and specifications for the construction, alteration, extension, or change of use of onsite wastewater systems

which receive domestic wastewater, prepared by an individual certified in accordance with Rule R317-11, shall be submitted to the regulatory authority."

- The construction and installation section R317-7 states "The installer may not deviate from the approved plans or conditions of the construction permit without the approval of the designer and the reviewing regulatory authority."

- The section on final inspections has the following statement (R317-8.1F) "Final approval shall be issued by the regulatory authority prior to operation of the system, and shall include an as-built drawing of the completed system."

- Appendix C – Soil exploration pits, soil logs, soil evaluations states that the logs shall include "the name(s) of the individual(s) conducting the tests, as per R317-11"

- Appendix D – Percolation method states "Percolation tests shall be completed by an individual certified per rule R317-11 and shall be conducted in accordance with the instruction in this appendix."

While the draft language implies that the testers/designers are separate from the regulators the language does not require it.

I believe that the regulators should only regulate and that the private industry should perform the site evaluations, soil evaluations, testing, design, installation and maintenance. However, I also see some inherent benefit to the regulator providing assistance to the property owner needing a system where there is very little to no risk at all in the use of an onsite wastewater system.

As such, I recommend strengthening the language regarding roles of testers, site evaluators, designers and regulators creating a stronger delineation of what roles each should be involved in. However, I also believe that for the simplest of systems there should be no problem in allowing the health department staff help a property owner evaluate options, including the determination of system sizing and location for the property.

To achieve this clarification I offer the following recommended changes:

Add the following paragraph within section R317-4-3.2. (new language)
A. All soil evaluations, site evaluations, percolation testing, system component sizing, system plans and specifications shall be conducted and prepared by individuals certified appropriately per R317-11. The regulatory authority will determine compliance to rule by means of inspection, oversight, and review of work performed and submitted for review by certified individuals.
B. The regulatory authority may have the option to perform site evaluations, soil evaluations, percolation testing and preparation of system designs for sites that have none of the following conditions.
1. Type 1, Type 5, or Type 6 soils

2. Percolation rates faster than 5 minutes per inch or slower than 60 minutes per inch.
3. Ground water within 10 feet of the proposed system depth, or depth evaluated to demonstrate feasibility.
4. Bedrock within 10 feet of the proposed system depth, or depth evaluated to demonstrate feasibility.
5. Soils with inconsistent horizons.
6. Slopes greater than 10%
7. Irregular topography or alteration of topography that may limit the functionality of a proposed wastewater system.
8. Watercourses, ponds, wells, land drains, lakes or other water features within 200 feet of the proposed wastewater system area.
9. Any other feature or potential issue which may give cause to limit the size, location or functionality of the proposed wastewater system.

Revise section R317-4-4 to: "The required information shall be prepared at the owner's expense by, or under the supervision of, ~~a qualified person approved by the regulatory authority~~. an individual certified in accordance with Rule R317-11"

Revise Appendix C – Soil exploration pits, soil logs, soil evaluations states that the logs shall include "the name(s) of the certified individual(s) conducting the tests, as per R317-11"

2. Alternative Systems program requirements

Explaining to a property owner that there are technology options that could be used to resolve a site condition on their property with the use of an alternative system, except that their particular health department does not have an approved program to administer the program is a very difficult discussion. Recommending that they ask their board of health or county commissioners to support the program has limited potential and places a significant burden on the property owner to resolve a program deficiency.

After years of thought and experience with this issue, I no longer support this approach as I used to. I think it's a mistake to prohibit the use of technology that my resolve a site condition unless the health department has the approval for alternative systems.

I recommend that serious consideration and thought be given to revisit this issue and remove the "alternative" classification for program approval. I ask that the rule be changed so that all property owners within the state have the option to use technology allowed by rule. If the LHD doesn't have the expertise, experience, or resources to administer the program, is there a better approach that provides options to property owners? Could DWQ issue the permits and oversee the program until the LHD can find a way to take that over? It seems to me that there ought to be a way to allow options to property owners instead of denying them a solution because the program isn't approved or desired by their local health department.

3. Embracing the potential advantages of the packed bed media systems

Packed bed media filters have been an acceptable technology within our rule for 6 years now. The technology is over 100 years old. For the last 30 years the design approach really has proven that the approach of treating wastewater is robust and reliable. To date, it's my understanding that all sampling results are well below the required limit and there has not been a single case of 'non-compliance'. Granted there haven't been a lot of systems permitted, but the point is that the systems are working very well, as intended.

Reasons for selecting packed bed media filters are typically as a last resort because the site conditions cannot be met with conventional systems. I agree with this approach. However, I also see several conditions where the advantages of a packed bed media system would offer a solution but the existing and proposed draft rule to not recognize this as an option. The result is that a property owner will be denied feasibility and/or a permit for a system on the property when the use of a packed bed media system would protect the environment and public health but.

As a whole, I believe that the onsite wastewater rules should embrace finding and allowing solutions for the handling and treatment of wastewater provided that the environment and public health are protected. I also believe that only in the event that the environment and public health is not protected should the issuance of a wastewater permit be denied.

I admit that my interpretation of protection of public health and environment protection may not be the same as others believe. However, I see that there are a number of site conditions listed and defined within the rule as "unsuitable" that could be considered "suitable" properties with the use of the alternative systems listed in the proposed draft rule.

As a whole, I recommend that language in the rule be more accepting or promoting towards the use of the acceptable technologies, as included within the rule, to find solutions for wastewater handling and treatment instead of concluding the property is "unsuitable" for any permit. The proposed draft language has changes that seem to me are actually more prohibitive and more likely to result in "unsuitable" conclusions.

The most obvious example of this are the statements that Type 1 soils are generally unsuitable for onsite wastewater systems. This is stated in multiple locations within the rule. However, when reviewing what a Type 1 soil is according to the tables I find that course sand, sand, loamy course sand, and loamy sand soils are Type 1 by definition. While some sands may be highly permeable, the tables also define Type 1 soils as soils with a percolation rate of 1-10 mpi. If these soils are a concern for conventional gravity septic tank absorption systems, why not allow packed bed media systems to be used for these sites. The organic loading and pathogen loading in the effluent of a packed bed media system is greatly reduced. Instead of concluding that the soils are unsuitable, I

recommend that the rule state that the soils are "unsuitable for conventional systems, but may be suitable with the use of alternative systems designed and permitted according to the rule requirements" or something similar.

Another good example is for blow sands. The rule language states that blow sand shall be deemed not feasible for absorption systems. Language further clarifies that although the sand may present with fast percolation rates and high permeability that the deposit of minute organic particles has the tendency to seal the soil. Well, the packed bed media systems remove up to 90% to 95% of organic matter and suspended solids, prior to discharging into the soils. I believe that with an acceptable method of reducing the organic matter, which is the concern with the soil type, that the soils should be considered 'suitable' for absorption systems.

Other examples similar to this also exist within the rule. Absorption systems require 48" of suitable soils. New draft language appears to indicate that there needs to be at least 24" of suitable soils where packed bed filters are used. Based on the language of the rule this appears to mean that soil below the absorption system must be a Type 2, Type 3, Type 4, or Type 5 soil at a depth of at least 24 inches. However, if the sub soils are Type 1 they are classified at "unsuitable" and would not be acceptable even for a packed bed media system.

Currently, permits are being issued for conventional septic systems that do not meet this requirement. Even with the existing language in rule. There are different reasons why this takes place. But nonetheless it happens. I recommend that the rule be changed to require packed bed media systems on all sites that do not meet the 48" of suitable soils. The organic and solids are being treated by the system. If the removal rate of pathogens is still a concern then the addition of UV disinfection prior to trench disposal could be used to provide additional protection. I believe that this would be preferred over denial of feasibility or a permit.

There are many examples where I believe the technologies could be used as solutions. If this approach is acceptable I'll provide a more detailed list of these scenarios. One last one to bring up is not specifically addressed in existing or proposed draft rule, but is becoming a more prevalent problem and/or concern. The drinking water source protection rules exist to protect the drinking water sources from possible contamination, including contamination from septic systems. Permitting onsite wastewater systems within protection zones appears to be an issue discussed more frequently. Specifically, whether or not a septic system is to be allowed in Zone 2. It's my understanding that conventional septic systems are not allowed within Zone 2 of a source protection zone. However, for similar reasons listed above, I believe that the use of a packed bed media system would be an acceptable risk in a Zone 2 source protection zone. Based on conversations I have had, it also appears that DDW staff would likely agree with this as the systems discharge treated, high quality, effluent and fall under an operating permit with compliance requirements in place to ensure proper operation of the system. Is there a reason why this possible option for properties within the protection zones is not

specifically mentioned? I recommend that the language be revised to clarify the acceptable use of the technology in this situation.

I recommend that as a whole, where sites are found to be ‘unsuitable’ for conventional gravity systems that the use of available technologies be strongly considered as a possible solution to the problem before denying a site by rule requirement.

General Comments

R317-4-1.4(D) – Any alternative system should be available to any property owner as a solution for the designer to utilize, providing the requirements for the technology can be met. Since the LHD has the option to require stricter requirements (see R317-4-1.4A) if there is a concern regarding a specific alternative technology the concern should be addressed by adopting and enforcing additional requirements to address the concern, not prohibiting the use of the technology as a whole.

R317-4-1.5 – Any alternative system should be available to any property owner as a solution for the designer to utilize, providing the requirements for the technology can be met. Also see program level comment #2. I recommend that the requirement be removed or that an alternative solution be found for a property owner that will be denied rights to obtain a wastewater system permit that would be possible except for this program approval not being obtained by the LHD.

R317-4-1.5(A)2(b) – I'm not sure this actually provides the assurance intended and ends up being a hassle to get through the process. Education is the real issue here.

R317-4-1.5(A)2(d) – What happens if the inspections committed to here are not done? I'm told that areas are already deciding not to adhere to these commitments and feel supported in that approach by DWQ. Is that correct? If it is, then the requirement should be changed to 'may' or even removed from rule language.

R317-4-1.5(A)2(f) – This type of information should be reported and available for all systems, not just alternative. Why is this requirement only listed for the alternative systems?

R317-4-2.19 – Course drain media. No mention of acceptable fines. I recommend that a maximum of 2% fines by weight also be required for this material, similar to the requirement described in the definition for drain media.

R317-4-2.21 – Connecting trench. What is the difference between a connecting trench and other types of absorption trench, other than the connecting trench has a maximum length of 20 feet? This appears to add a new, confusing term to the rule. Confusion is a result of the term is only used in three areas of the rule. First is in the definitions. Second is for serial or sequential systems where the solid line is laid in a 'connecting trench excavated to the exact depth required' which implies it should not be used in absorption area calculations, a conflict with the definition. Third is in absorption and deep wall trench length language where the term is used to clarify that the 'connecting trench' between laterals is not to be used as part of the maximum length of an absorption trench. I recommend changing the definition to be a connection between absorption trenches where solid pipe is used and the length is not part of the absorption area calculations. Additionally, I recommend rewording the clarification in absorption trenches and deep wall trenches to specify that the maximum length of 150 applies to any particular "lateral" as defined as a overall length of distribution pipe within a straight length of trench. See R317-4-2.54 and comment on lateral definition below.

R317-4-2.26 – Designer. Add sentence to end of definition stating that the designer shall not be the same as the regulatory authority unless deemed acceptable per R317-4.3(A)1 (New text proposed. See comment below for R317-4-3.3(A)1)

R317-4-2.40 – Effluent sewer. The term 'effluent sewer' has been branded within the industry to mean a collection sewer system utilizing septic tanks with smaller diameter gravity and pressure collection lines to a discharge point or treatment system. It is synonymous with STEP/STEG collection systems. This is a new term added to this proposed draft rule to describe the solid pipe between a septic tank and the absorption system. To avoid confusion, I recommend a different term for this section of piping be used. The existing rule uses 'distribution pipe' and the definition for distribution pipe works, it's only draw back is that it includes both solid and perforated pipe, which might be confusion, but I believe is less confusing than the potential is with the new term as proposed. Possible options might include distribution sewer, solid distribution pipe, effluent pipe, etc.

R317-4-2.4x – Force main. I recommend that a new definition for the force main pipe be added. Recommended language for consideration is: "Force main" means a solid pipe pressurized for the conveyance of wastewater or effluent. The minimum pipe diameters listed in this rule for gravity lines shall not apply to force main pipe sizing. The pipe diameter should be the smallest diameter practical based on hydraulic calculations, prepared following the requirements as outlined in this rule.

R317-4-2.50 – Impervious strata. This definition states that a layer is defined impervious or 'unsuitable' where percolation rates are slower than 60 minutes per inch. Type 5 soils and soils with percolation rates slower than 60 minutes per inch, up to 120 minutes per inch are 'suitable' with the use of packed bed media systems. Language should be changed accordingly. Recommend changing 60 to 120 to reflect available options within the rule.

R317-4-2.54 – Lateral. Recommend changing to: "Lateral" means the overall length of distribution pipe in a straight length of trench within the absorption system.

R317-4-2.62 – Non-domestic effluent. Recommend that BOD5 be changed to cBOD5.

The summary of key revisions adds some confusion to this term. Based on the rule, a non-domestic system has effluent of high strength waste and is required to treat to below non-domestic levels prior to discharge. However, the summary uses the term 'commercial' interchangeable with 'non-domestic'. Commercial systems may not meet the defined parameters of a non-domestic system requiring pre-treatment. I recommend review of the intent for both commercial and non-domestic systems to clarify confusion already presented in summary format.

R317-4-2.63 – Non-domestic wastewater. The definition implies that non-domestic wastewater is the result of manufacture of products. However, several commercial applications would likely fall under the wastewater strength definition of non-domestic effluent. Specifically, most if not all restaurant or food preparation facilities as well as many office or rest area type applications

would likely exceed the limit for domestic waste strength. Is the intent to require treatment on all higher strength applications, including restaurants, offices, rest areas, etc.?

R317-4-2.65 – Non-residential. See comment above for non-domestic effluent. Do most non-residential applications also need to meet requirements stated for non-domestic systems? Effluent filters, access risers to grade, septic tank sizing, etc.?

R317-4-2.74 – Pressure distribution. The definition proposed could also be interpreted to a force main line as written. A force main pipe to a d-box or other gravity system is not alternative, where pressure distribution systems are proposed as alternative status systems. I recommend that this definition be revised for clarification. Recommended text: "Pressure distribution" means the even distribution of effluent into an absorption system through a network of perforated piping or drip tubing.

R317-4-2.75 – Pressurized absorption system. Defines pressurized distribution systems as alternative, which requires LHD program approval and additional oversight requirements. From a design perspective, a pressurized distribution system is not much different than a pump to gravity system. I seriously question the need to limit the use of this technology to alternative system program requirements. No credits, reductions to site constraints, reductions in sizing, etc. are provided for the use of pressurized distribution. Yet, the option greatly improves the expected performance and operational life of a conventional system. Maintenance concerns mentioned to defend this approach are extremely conservative. Why limit the use of a technology that has long been recognized within the onsite industry to provide superior treatment, operation, and protections to mandate increased regulative oversight.

I recommend that this technology not be classified as an alternative system and specifically ask for justification regarding what inherent risks or concerns are associated to this system that justify this additional oversight over a pump to gravity system that is not considered an alternative system.

R317-4-2.76 – Pretreatment. This definition has confusing language. I recommend the following alternative language: "Pretreatment" means a process which alters the wastewater strength to levels below the definition of non-domestic effluent.

R317-4-2.86 – Sand media. It's my understanding that sand media used in mound and intermittent sand filters generally meets this standard, provided that the percent course and percent fines are below acceptable levels. Where I've seen reference to C33 sand it usually has an additional requirement for maximum percent of course media greater than 2 mm and a limit of % fines smaller than a 100 or 200 screen.

Will there be any limits of course or fines allowed that meet C33 sand? Has this been evaluated? This has a direct impact to acceptable loading rates on the media proposed.

R317-4-3.3(A)1 – New proposed section. See my program level comment #1.
I recommend the following be inserted into this section:

A. All soil evaluations, site evaluations, percolation testing, system component sizing, system plans and specifications shall be conducted and prepared by individuals certified appropriately per R317-11. The regulatory authority will determine compliance to rule by means of inspection, oversight, and review of work performed and submitted for review by certified individuals.

B. The regulatory authority may have the option to perform site evaluations, soil evaluations, percolation testing and preparation of system designs for sites that have none of the following conditions.

1. Type 1, Type 5, or Type 6 soils
2. Percolation rates faster than 5 minutes per inch or slower than 60 minutes per inch.
3. Ground water within 10 feet of the proposed system depth, or depth evaluated to demonstrate feasibility.
4. Bedrock within 10 feet of the proposed system depth, or depth evaluated to demonstrate feasibility.
5. Soils with inconsistent horizons.
6. Slopes greater than 10%
7. Irregular topography or alteration of topography that may limit the functionality of a proposed wastewater system.
8. Watercourses, ponds, wells, land drains, lakes or other water features within 200 feet of the proposed wastewater system area.
9. Any other feature or potential issue which may give cause to limit the size, location or functionality of the proposed wastewater system.

R317-4-3.7 – Property lines crossed. Section states that the easement shall meet the setbacks specified in Table 2. Does this mean that the area within the easement must meet the setbacks or that the easement must also include the setback area? Is there any concern where a system is sited off property, within an easement, that initially meets the setbacks but later is changed outside of their control?

R317-4-3.11 – Repair of a malfunctioning or unapproved system. Depending on where within the state, there appears to be great differences on how the repairs of existing systems are handled. The range varies from absolutely no LHD involvement or oversight to an opportunity to 'bring the property into compliance with all current rules'. This results with some systems being designed and installed that are not appropriate and/or even needed to other property owners without options as their systems age and need upgrades or repairs. Many LHDs are flexible and work to the best solution available based on the specific situation. This approach makes sense. However, due to the varied application and involvement on working with existing systems I recommend the following language be added in this section:

Repairs or modifications to existing systems should meet all of the requirements within this rule to the extent possible. However, the regulatory authority shall have flexibility in issuing a repair permit for an existing system that does not meet all rules provided the following conditions are met;

- The proposed system will not discharge to the waters of the state
- The proposed system will not discharge to the ground surface

- The proposed system meets all rule requirements to the extent possible and is an attempt to improve rule compliance, protection to the environment, protection of public health or overall operation and performance of the existing system.
- The proposed system does not create any new identifiable risks to the environment or public health.

R317-4-4 – Feasibility determination. See program level comment #1. Recommend the last sentence of the introduction paragraph in this section be changed as follows; "The required information shall be prepared at the owner's expense by, or under the supervision of, ~~a qualified person approved by the regulatory authority~~. an individual certified in accordance with Rule R317-11"

R317-4-4.1(B)1 – Soil and site evaluation. Comments raised significant concern in the first stakeholder's meeting regarding the change to allow percolation testing as optional. I have significant concerns here and am looking forward to productive dialog within the stakeholders group to determine how best to proceed with this particular proposed change to make percolation testing optional.

R317-4-4.1(B)1(c) – Absorption systems are generally not feasible in soil types 1, 5, and 6 or are not feasible where the percolation rate is slower than 60 minutes per inch or when faster than 1 minute per inch. Also see program level comment #3. This statement appears to be solely focused on conventional gravity septic to absorption trench systems. It doesn't include absorption systems that follow a packed bed media system. Sub-paragraph i. states that for systems using a packed bed media system soil type 5 or percolation rates up to 120 minutes per inch may be feasible. Does this include all Type 1 soils, including soils with percolation rates faster than 1 minute per inch?

R317-4-4.1(B)1(d) – Excessively permeable soil. States that Type 1 soils, or soils that have a percolation rate faster than 1 minute per inch shall be deemed not feasible for absorption systems. Table 1 states that Type 1 soils are soils with 10 minute per inch or faster percolation rates. If all Type 1 soils are to be deemed not feasible by soil classification how are percolation rates of 1 – 10 minutes per inch to be handled? Are they feasible? There is not a sub-paragraph within this section to clarify that the permeable soils are feasible with the use of a packed bed media system. Does the use of a packed bed media system change feasibility determination for highly or excessively permeable soils? I recommend that this be changed to allow feasibility when packed bed media systems are used. Also see program level comment #3.

R317-4-4.1(B)1(e) – Blow sand. See program level comment #3 and comments above. I recommend allowing the use of packed bed media systems in blow sand conditions to allow onsite wastewater system feasibility rather than denial of feasibility for a proposed system.

R317-4-4.1(B)2 – Suitable soil depth. States: For conventional systems, effective suitable soil depth shall extend at least 48 inches or more below the bottom of the dispersal system to bedrock formations, impervious strata, or excessively permeable soil. Some alternative onsite wastewater systems may have other requirements. See comments above as well as program level comment #3. Packed bed media systems provide treatment and reduced risk to the

receiving environment. I recommend allowing system feasibility to sites that do not meet 48" of suitable soil depth provided that packed bed media systems are used to treat the wastewater effluent prior to dispersal.

R317-4-4.1(B)4 – Ground slope. States the maximum slope for an absorption system is 25%. I spent many years defending this limit for absorption systems installed in sloping sites. However, after working in other states I've witnessed successful installations in steeper slopes. There is the option to request for allowing installations on steeper slopes through the variance. The variance process has not been tried, at least that I'm aware of. It does appear to be a daunting approach. Has any work or effort been put into investigating whether or not it would be possible to increase the acceptable slopes for absorption systems? The rule allows systems closer to steep slopes greater than 35%. Did any of the information used to support that change also indicate that systems could be installed on slopes steeper than 25%? If this can be safely supported, I recommend that over denying site suitability. There are many properties that are limited or prohibited due to slopes greater than 25%.

R317-4-4.1(B)5(c) – Flood plain. The section requires any flood plain to be clearly shown and labeled on any proposed plan. Doesn't state whether or not it may be feasible for an onsite wastewater system to be located within a flood plain area. Ground water table separation requirements should, in theory, prohibit installations in flood plain areas. However, a question I have had in the past is where a flood plain condition might only exist once in 25, or 50 or 100 years is there any option of feasibility based on reduced risk of a once in many years contact in water? If there is an acceptability locating a system within a flood plain that should be clarified in text. If not, since it is mentioned, clarify in the text that absorption systems within a flood plain are not feasible.

R317-4-4.1(C) – Unsuitable. The is really stating the obvious. However, it might also lead to pre-mature denial of feasibility. I'm aware of initial indications that a site is unfeasible yet after more examination a determination of feasibility is obtained. I recommend that the entire statement be deleted.

R317-4-4.1(C)1 – Method 1 lot size determination. This section is somewhat vague regarding the area that must be included or evaluated as part of the required information within the report. For example, does the area to be studied stop at the development boundary or include a larger area of influence? Only studying the development boundary might result in misleading information. Yet, requiring larger areas becomes problematic. Would the development be required to address issues in the larger area, region, valley, basin? Where does it stop? I'm aware of indications were a 15 to 30 lot proposed development has been told that they would need to study the entire valley to arrive at a different lot size determination. This seems excessive from that perspective.

For the most part, Method 1 lot size determinations have not been done because of these and other aspects of this option. This proposed draft rule requires that Method 1 be used for determining lot sizes where Type 5 soils are present. Ironically, systems allowed in Type 5 soils actually end up with smaller absorption systems after credits are used. Additionally, the effluent discharged is treated, greatly reducing risks of pollution. So concerns for sizing the absorption

systems don't seem to be the driving factor in forcing Method 1 to size the lots. This section really needs to be thought out better or it will only lead to using the process to implement zoning not determine the minimum lot size required to site a system.

R317-4-4.1(C)2(b) – Non-residential systems require one-half of the lot be available for the absorption system. This has problems with both small and large non-residential properties and does not guarantee that there will always be enough ground for the absorption system. It also has the potential to require considerably more property to be reserved for absorption systems than would ever be necessary. It's an arbitrary prescriptive requirement with no correlation to the actual area that needs to be provided for the absorption system. This is only part of the language used in current rule. Deleting the language from existing rule to determine the area reserved based on gallons per day for the facility makes this statement inappropriate if not just wrong. At a minimum this statement still needs the area determination used to calculate one half of. Preferably delete the statement altogether and require that the area be adequate for the primary and a full replacement area based on the gallons per day anticipated for the subject property.

R317-4-4.3(A) – Statement indicates that subdivision feasibility does not imply that it will be possible to install an onsite wastewater system on all of the lots. It also clarifies that feasibility means that systems may be installed on 'the majority' of the lots. I believe that this thought process dates back many years when the general consensus was that it's only a matter of time until community sewer would be available at the lots, so it wasn't necessary to have feasibility for all lots.

The rule requires that each lot be tested and evaluated for system feasibility. If this is done, any lot(s) found to be not feasible should not be approved, rather the proposed subdivision plat should be changed such that all of the lots are feasible for an onsite wastewater system, even if it's only a 2 bedroom design. Issuing subdivision approval based on 'the majority' of lots meeting feasibility seems ridiculous if not irresponsible. I recommend deleting the statement indicating that feasibility "means… systems may be installed on the majority of the proposed lots" and adding language that states that feasibility shall only be issued when all lots indicate feasibility for a minimum of the smallest onsite wastewater system approvable by rule.

If this is not possible, then delete section 4.2 altogether because what good is a feasibility statement if it doesn't include actual feasibility for the lots being approved? It's only a false sense of security as it's currently written.

R317-4-5.1(A) – Plan review and permitting. Statement reads "…prepared by an individual certified in accordance with Rule R317-11, shall be submitted to the regulatory authority." Recommend changing to "… prepared by a designer shall be submitted to the regulatory authority."

R317-4-5.1(D)2 – Plot plan. Recommend changing statement from Plot Plan to " Onsite Wastewater System Design Plan"

R317-4-6.1(B) – Systems located on property or within easement. This section is mostly redundant with the language in section R317-4-3.7. Consider deleting one of the sections to reduce redundant statements.

R317-4-6.3(A) – Single family dwellings. This section defines the minimum flow rate of single-family homes to be calculated based on 150 gpd/bedroom. I understand that the square feet per bedroom tables in the existing rule are most likely based on this value. However, the reality is that this results in unrealistic flow rates. Traditional use of 150 gallons per day per bedroom usually includes I&I. Onsite wastewater systems should have very low to no I&I and do not need to be designed for it.

Based on a lot of field date, it's my experience that typical flow rates on a per home basis generally average between 150 gpd to 225 gpd. More recent studies are showing that the flow rate on a per person basis is between 40 to 60 gallons per day. Census data indicates that the average number of persons per household is between 3 and 3.5 for much of Utah. Family sizes are closer to 3-4. Using 4 people per family this still results in typical flow rates for a single-family home at about 240 gallons per day.

During the previous rule revision in 2005 this was commented on. During the public comment period DWQ staff responded by stating: "We concur with the comment and the proposed changes to the change will require: A minimum of 300 gallons per day for two bedrooms and 100 gallons per day for each additional bedroom." This was within the section proposed on mounds and packed bed filters as proposed at the time. The language in the mound section was deleted altogether, leading some to interpret that a different flow rate per bedroom be used for packed bed filters than what is to be used for all other onsite wastewater systems. This results in confusion. Packed bed filters to not result in less water use that other single-family systems.

I recommend using the 300 gallons per day for the first two bedrooms and 100 gpd for each additional bedroom on all systems, as was agreed to by DWQ staff in 2005 and supported by research as well as field data for water use within single family homes. It stills ends up being very conservative, as most onsite wastewater designs will be based on 400 gpd to 600 gpd, which is actually two to three times more than actual use will be.

R317-4-6.5(A) – Building sewer diameter. Requires a minimum pipe diameter of 4" for building sewer between the building and the septic tank. The plumbing code often allows smaller pipe resulting in an increase from 3" to 4" right outside of the building to meet this requirement. Why not allow the same size as required by plumbing code for the building? What need is there to make it a 4" minimum?

R317-4-6.5(C) – Cleanout requirement. Why? Consider extending this requirement. Lines can be cleaned at much longer distances. Standards I've seen are that a line can be jetted up to 200 feet. With bi-directional cleanouts this would allow a distance of up to 400 feet.

R317-4-6.5(C)1 – Cleanout requirement. Requires clean outs where change in direction exceeds 135 degrees. This is (3) 45 degree changes. Shouldn't there be consideration at 90 degrees?

What is the basis for this change? Where this is before the septic tank, it seems appropriate to have cleanouts required before you reach 135 degrees as proposed.

R317-4-6.6(A) – Liquid capacity of septic tanks. This language removes the old equation of 0.75Q + 1125. Good change. New requirement is for a hydraulic retention time (HRT) of 1.5 days. I recommend a minimum HRT of 2.0 be considered. Flows are less than 5,000 gallons per day for systems in this rule. Single family tanks sized based on the number of bedrooms are typically sized at 1.94 to 3.33 HRT. Larger tanks help reduce pump out frequency and for the smaller systems makes more sense in the long run to have a larger tank. Flows greater than 5,000 gpd are different and a smaller tank sized at 1.5 HRT makes sense.

R317-4-6.6(B) – Tanks in series. Requires the first tank or compartment to be 2/3 of the total required volume. This ratio split works well with single family sizing, but can be more difficult to implement and manage at larger sizes. I recommend that the ratio requirement be removed. A statement might be considered to reflect that smaller initial tanks might require more frequent pumping and where possible the first chamber/tank shall be as large as practical to reduce pumping frequencies.

R317-4-6.6(B)3 – Connection between tanks in series. "…shall be unrestricted except for the inlet to the first tank and the outlet for the last tank." Does this mean no baffles or tees between tanks? Inlets to successive tanks work fine without a baffle or inlet tee. Will this be allowed now?

R317-4-6.6(E) – Effluent screens. Effluent filter and effluent screens are terms used for the same thing. Only one should be used to reduce confusion. I recommend that effluent filter be retained and not change the language to effluent screen.

R317-4-6.6(E) – Effluent screens. States that effluent screens are required for non-domestic wastewater systems, which per the definitions are high strength systems. However, in the summary of key rule changes it states that all "commercial" systems will be required to have effluent filters. Language needs to be revised to clarify what is being required.

I also recommend that all systems have an effluent filter. This was the intent back in 1999/2000 rule revision but was changed to optional at the last minute before rulemaking.

The section also says that for the non-domestic systems requiring an effluent filter the requirement is "unless screening is achieved by some other means acceptable to the regulatory authority". What is this for? What is an example of another acceptable mean to accomplish this?

R317-4-6.6(F)1 – Riser heights. Adds the language that the risers should, preferably, extend up to finished grade. This is a good improvement. However, I still recommend that they all be extended up to finished grade. There are many reasons to support this from cost savings over the life of the system to increased likelihood that the system will actually be maintained and pumped prior to system failure. Safety concerns can be addressed to ensure public safety.

R317-4-6.6(F)1(b) – Risers to finish grade. Requires risers to finish grade for non-domestic systems. This is a good addition. However, with the confusion between non-domestic systems is this only for high strength systems or is it for all non-single family systems? Does it include non-residential or commercial systems?

R317-4-6.6(F)5 – Multiple risers required. This section requires at least two risers for systems with flows greater than 3,000 gpd. More than likely this will be for a non-residential system. Will they be required to extend to finish grade?

R317-4-6.6(G)2(c) – Water tightness test. This section requires the water tightness test prior to backfill where the depth of the septic tank is deeper than 48" per the requirements in section R317-4-8.1(A). However, the requirements in section R317-4-8.1 already require this. Seems to be a redundant statement. Consider deleting.

R317-4-6.7 – Grease interceptor tanks. Requires that grease interceptor tanks are to be sized per the current plumbing code. What are these requirements? Based on what I'm familiar with this will be a decent improvement, but may still be a bit on the small side.

R317-4-6.8(B)1&2 – Pump tank storage volume requirements. Section requires a full day flow in emergency storage or at least two independent power sources. Although the intent is logical, in practice it's very conservative and unnecessarily increases the overall cost of a system. I'm aware of many systems that are installed without these requirements that operate just fine in other jurisdictions. What data or history or information was used to support these new requirements?

There are two separate issues at hand here. Storage for mechanical problems and storage for power outages. Mechanical problems can be mitigated by response time, spare parts on hand, redundancy, etc. additional storage volume may help with mechanical problems, but independent power does not. Power outages often last part of a day with return of power usually on the same day. Some extreme power outages might last a day or two, but conservation of water use can often mitigate this if not the loss of power by itself. Is there enough concern, data, history or information being considered to add these requirements to the existing rule?

The current rule requires that the designer state what volume is being provided for emergency storage. The intent was for the designer to be aware of the operating volumes and justify what is proposed. To my knowledge there is not one instance where this has not been enough. Yet multiple systems are approved and installed that do not meet this new requirement.

This is excessive and should be left for the designer and property owner to decide what is appropriate for an "emergency" situation. If the regulatory authority has concerns with this they can always advise the homeowner about the risks of overflow or backup. But I don't think the rules should mandate this extra cost for all systems that have a pump.

I recommend that these requirements be deleted and kept as in current rule.

R317-4-6.8(D) – Upstream tanks require an effluent filter. The section requires the outlet of the septic tank located upstream of a pump tank to be equipped with an effluent filter. The effluent filter located within the pump tank or as part of a pump vault is usually larger than the basic outlet effluent filter in a septic tank. There are many ways to locate an effluent filter before a pump. I recommend that this statement be changed to read: "An effluent filter is required in front of the pump intake on all systems with an effluent pump"

R317-4-6.9(B) – Pump vault screens. Another example of interchanging effluent filter with effluent screen or just screen. Recommend that the word effluent filter be used.

R317-4-6.9(D) – Pump vault used in any tank other than a pump tank. Section requires that the tank be increased in volume by 250 gallons or 10%, that two independent power sources be installed, and that the maximum drawdown per dose be no more than 2 inches. Why?

Pump vaults can be used in septic tanks, grease tanks, recirculation tanks, dose tanks, and pump tanks. This language as written would add unnecessary requirements for all of these configurations, except for the pump tank, which might be considered the same as a dose tank, but it's not very clear.

Why is the volume requirement being increased by 250 gallons or 10%? What data, research, or information supports this requirement? I'm aware of 1,000's of systems operating just fine without this requirement. I've been told it's a concern of solids within the septic tank, specifically interfering with scum and sludge levels. However, I suggest that this is based on theory not real experience. Pumping out of a septic tank does not interfere with scum and sludge processes as long as the flow rate be managed appropriately. Acceptable flow rate is a function of the size or dimensions and retention times within the tank. Larger tanks can support higher pump flow rates, but all septic tank sizes can support pump flow rates without negative consequences in scum and sludge separation. Again, what data supports this where field experience shows it works just fine without increasing the volume?

The requirement for two independent power sources is redundant here. It's already proposed for pump and recirculation tanks as commented above. See previous comment on this issue. I recommend that this statement be deleted.

The requirement for a maximum drawdown per dose of no more than 2 inches doesn't make sense. The increase of 250 gallons or 10% is more than the 2" drop allowed. For demand (float controlled) systems, this is very difficult if not impractical. Most floats recommend 2" to 3" minimum spacing, depending on the float type. Again, I'm not aware of any data or research that supports this and wonder if it's not based on theory (incorrect) not actual real experience. I recommend that this statement also be deleted.

R317-4-6.11 – Sampling ports. Non-domestic wastewater mentioned in this requirement for sampling ports. Does this apply to high strength systems, non-residential, commercial, etc.?

R317-4-6.12 – Effluent sewer. See comment on definition and confusion with term used.

R317-4-6.12(D) – Cleanouts required every 100 feet. Why? This is for effluent, after septic tank removal of scum and sludge. Consider extending or removing this requirement. Lines can be cleaned at much longer distances. Standards I've seen are that a line can be jetted up to 200 feet. With bi-directional cleanouts this would allow a distance of up to 400 feet. But is it really necessary for effluent?

R317-4-6.13(B)1(a) – In lieu of a replacement area. States: "in lieu of a replacement area, two complete absorption systems shall be installed with a diversion valve. Change 'shall' to 'may'. The statement already clearly states that the option is in lieu of a replacement area. The use of the word may here is more appropriate.

R317-4-6.13(B)4(h)i – Effluent pipe in line with trench lateral. Statement is redundant with section R317-4-6.12E.

R317-4-6.13(B)4(h)ii – Change the term 'non-perforated' to solid

R317-4-6.13(B)4(h)iii – Distribution pipe under driveways. Why prohibit this? With appropriate design it can work.

R317-4-6.13(B)4(i) – Exceptions for installations under driveways. Why limit this to deep wall trenches and filled seepage pits. Consider allowing for other gravel filled options like standard trenches where design considerations or system depth protect the performance of the system. Requires the driveway to be unpaved. Paving would decrease compaction, improving trench performance. Risk to paving would be from soil saturation. Paving should reduce risk of saturating the soils. Consider allowing under a paved driveway as a case-by-case scenario. The case-by-case review should reduce this option to an as needed option.

R317-4-6.13(D) – Effluent distribution boxes. Section refers to an 'effluent distribution box' which appears to be a new term. Definition is for a distribution box.

Concrete boxes made often corrode if they are not the same concrete mix required for septic tanks. Clarify that the material needs to be non-corrosive.

R317-4-6.13(F)1 – Absorption trenches. Why does there need to be a minimum of 2 trenches. If the total length required can be done within a single trench, why not allow that as an option? This may be more likely with the trench length increase from 100 feet to 150 feet.

R317-4-6.13(F)1(x) – Observation port mentioned as a "may" where the first sentence of the section R317-4-6.13(F)1 requires that the absorption trenches "shall" conform to the following: which includes line (x). Are they required or an option?

R317-4-6.13(F)1(a) – Standard trenches. Language interchanges the use of effluent pipe and distribution pipe in lines ii and iii.

R317-4-6.13(F)1(b)ii(3) – Chambered trenches. Allows a 30 percent reduction in absorption area for chambered trenches. How is this reduction justified? The organic loading onto the soil

is actually higher in gallons per day per square foot as a result of this reduction. What data and research supports this reduction? Reductions are also listed elsewhere in this rule for packed bed media systems and for non-residential systems. Reductions for chambered and packed bed media systems are at 30%. Reductions for non-residential systems are up to 40%, yet the wastewater strength for these systems has the potential to be even higher.

For many years I have asked for this to be explained. Several years ago I was assured by DWQ staff that they would review the science and information available and make adjustments if appropriate in the next rule draft (this version). Has this been done?

I have also submitted research supporting higher loading rates for packed bed media systems. Yet, I've been told that there will be no additional reductions allowed and have been asked to back off or the other reductions would be removed. This whole discussion has not been based on science or system performance.

If the reduction is appropriate for a chambered trench why shouldn't it also be applied to other trench systems that receive the same organic load and are gravity dosed? Most of the research I'm familiar with on this is actually based on the organic loading to the soil more so than the type of media, or lack of media, in the trench. Another approach to reducing trench sizing is based on the benefits associated to pressurized distribution. Yet, organic loading does not appear to be part of the evaluation process and pressurized distribution language added to this rule specifically prohibits any absorption area reductions.

I request for this reduction to be explained as to why it was put in place and what supporting information was used. I also request an explanation as to why it has been greater than for treatment systems or in this draft version equal to a system that removes BOD and TSS to less than 25 mg/L (typically to less than 5 mg/L). Also see my comments regarding packed bed media systems and non-residential systems in their respective sections of the draft rule.

R317-4-6.13(F)1(c) – Bundled synthetic aggregate trenches. How does the pipe have the minimum 6" of aggregate below the pipe when it is centered within the bundle as mentioned? Seems to conflict in how the bundle is to be manufactured.

Is there a requirement for any type of barrier above the bundles before backfilling?

R317-4-6.13(F)2 – Absorption beds. Recommend that the maximum distance between laterals be changed from 6 feet to 3 feet to promote more equal distribution within the bed. Recommend that the maximum distance from the laterals to sidewalls be changed from 3 feet to 1.5 feet.

R317-4-6.13(F)3(e)– Deep wall trenches. Media depth is used here where the definitions for medias are for sand media, drain media and course drain media. The statement should be clear. However I recommend that the term effective sidewall depth be used instead of media to minimize any confusion.

R317-4-6.13(F)4(a) – Seepage pits. Paragraph a is redundant where the statement before refers to deep wall trench requirements and this is already covered in the deep wall section.

Since the language is supposed to be covering exceptions to the deep wall trench requirements is doesn't make sense to restate that the sizing is to be based on tables 5 & 6. What is the exception?

R317-4-6.13(F)4(b) – Seepage pits. Paragraph b is also redundant not an exception. What is the exception to only considering the effective depth?

R317-4-6.13(F)4(d) – Seepage pits. Seepage pits rely on the circumference area for sizing. To be sized correctly they usually are very deep or are used in multiples. This limit to effective depth of 10 feet will limit the option and require more pits. No recommendation of a change here. Just a comment on the change. Has this been considered? I have heard many comments over the years that seepage pits used for absorption systems have been undersized from what the rule actually requires. How does limiting the effective depth affect the sites being installed now? Are they deeper than 10 feet?

R317-4-6.14(B)4 – Record on deed of ownership. Why? What does this accomplish? I have always thought it was to help educate and notify future owners about the type of onsite wastewater system that they have or are purchasing. However, actual feedback from new homebuyers indicates that this doesn't work as intended. With renewable operating permits the owners are able to learn about the system and the requirements to operate said systems. I recommend that this be removed and more emphasis be placed on educating the homeowners to disclose the existence of the wastewater system and it's operating requirements. This awareness effort could also be part of the operating permit process.

R317-4-6.14(C)1(b) – Observation ports. Other language in the rule use the term monitoring port. I recommend that either observation or monitoring port be selected and used throughout to reduce confusion.

R317-4-6.14(C)1(b)i – Observation ports. Recommend that the language be changed to: "The bottom of the monitoring port shall be installed at the depth of the trench or bed excavation."

R317-4-6.14(C)2(a)iv – Maximum slope of 25% for natural ground surface for mound systems. This is a redundant requirement based on section R317-4-4.1(B)4. Unless the mound systems have a different slope requirement I recommend that it not be stated again here. However, as per my comment on ground slope mentioned above, I question whether or not this is the correct maximum slope for absorption systems. I have seen absorption systems successfully installed in other states. Additionally, while doing research for the previous change from a maximum slope of 4% to 25% for mound systems I discussed the matter with Jim Converse. Jim indicated strong support for steeper slopes. He informed us that mounds actually work better on steeper slopes and that he would be more concerned about siting them on flat sites. This was critical information in the previous change. What he also told us at that time is that the reason Wisconsin has a 35% maximum slope is not because the system will not work on sites with slopes steeper than 35% but that it's because they had feedback that backhoe operators didn't believe it was safe to construct on slopes steeper than 35%. The last thing desired is an unsafe condition for installation. However, it is possible to deal with safety issues and on some of the steeper installations I'm aware of they have been put in by hand.

R317-4-6.14(C)2(a)x(1) – Observation ports. Recommend that the language be changed to: "The bottom of the monitoring port shall be installed at the depth of the trench or bed excavation."

R317-4-6.14(C)2(b) – Pressure distribution. Section refers to the pressure distribution guidance manual and section R317-4-6.14(C)4 which is the section on pressurized absorption system, which also refers to the guidance manual and adds a reference to appendix B. Section 6.14(C)4 also adds some requirements on pumps, controls, and pressurized pipe. One of the overall positive changes of this draft rule is how well it's organized and cleaned up. This though seems to still have reference to reference to section to appendix, etc. What's not referred to here are the requirements already commented on for pump tanks in section R317-4-6.8, 6.9, 6.10, or 6.13(C). Is there a way to locate all pump tank, pump, controls, pressure piping, etc. requirements in single location similar to many of the other improvements of organization in the draft? My initial thought is to consolidate these requirements in Appendix B. Has that been considered?

R317-4-6.14(C)3i(2) – Packed bed media systems. Paragraph states that packed bed media systems may be used in soil types 1 through 5 or in soils with a percolation rate between 1 to 120 minutes per inch. See previous comments on accepting packed bed media systems on soils with percolation rates of "up to 120" minutes per inch as is stated in section R317-4-4.1(B)1(c)i.

R317-4-6.14(C)3i(2)(c) – Packed bed media systems. Statement reads "Above soils which have a percolation rate faster than 1 minute per inch 24 inches". The wording could be improved, but this appears to state that if there is 24 inches of soil below the packed bed filter with a percolation rate slower than 1 minute per inch, then the soils below that can be faster than one minute per inch and still allow a packed bed filter. Effectively reducing the requirement of 48 inches of suitable soil to 24 inches. Is this correct? If so, I recommend changing the wording to clarify this because it's confusing to read. I also recommend, as stated in previous comments, that the packed bed filters be allowed in soils up to 120 minutes per inch and that site suitability not be denied based on fast soils. Too many sites are allowed to be built on that have percolation rates faster than 1 minute per inch already. This is done because it's very difficult to deny a permit. Providing an acceptable solution to the problem is preferable to denying a permit or allowing it anyway.

R317-4-6.14(C)3i(4)(b) – Other flows. States that all other flows (besides flows estimated by bedroom count) be based on Table 3. Section R317-4-6.3(B) states that actual measurements are preferred over estimated flows included in Table 3. If the comment on section R317-4-6.3(A) is accepted, then I recommend this language refer to R317-4-6.3 as a whole. Otherwise, include language in paragraph (B) to reflect preference to actual flow measurements, then where measurements are not available, use table 3.

R317-4-6.14(C)3i(4)(c) – Special design considerations shall be given for non-domestic effluent. Is this for high strength wastewater only? Does it include non-residential or commercial applications as well? What special design considerations shall be given? How does a

designer address this open ended, vague statement? I recommend that the special considerations be listed or outlined as applicable.

R317-4-6.14(C)3iii(1) – Absorption area reduction of 30 percent for packed bed media systems. Will this reduction be able to be used in conjunction with chambered and non-residential reductions included within this draft rule? If a project is a non-residential system with a packed bed media system and chambered trenches will all three reductions be accepted?

What data and research was used for this reduction? I have asked for years for staff and LHD's to explain why the reduction for packed bed filters is less or, in this draft rule, equal to the reduction for chamber trench systems. Was any of the soil loading rate information for packed bed media systems reviewed or used? Is organic loading a factor in determining absorption system area reductions? Research supports reductions based on organic loading and pressurized distribution methods. I don't see either of those factors being part of the reductions as proposed in the draft rule. I have a difficult time seeing the logic in the area reductions in proposed draft rule. I'm very interested to hear how this and the other reductions proposed in the rule have been determined. How has this been determined?

R317-4-6.14(C)3iii(2) – Packed bed media system flow determination. Paragraph 2 and 2a are redundant to section R317-4-6.14(C)3i(4).

R317-4-6.14(C)3iii(4) – Observation ports in packed bed media absorption systems. See previous comments regarding the use of observation or monitoring port language. Where this keeps coming up in multiple sections, I ask why monitoring ports are not in all absorption systems. I recommend that they be required for all absorption systems.

R317-4-6.14(C)3iv(3) – Non-absorption components. What are the non-absorption components referred to here?

R317-4-6.14(C)3(a)ii – ISF application rate. Application rate has been reduced from 1.2 to 1.0. Why? Also, sand media gradation requirement has been changed to meet the same definition as for mound systems. As noted earlier, C33 sand can have higher concentrations of fines than has been specified for ISF in the current rule. Mound systems are similar to ISF systems. However, the loading rate is lower due to the allowance of finer sands in C33 sand and the shallower depth of only 12 inches in a mound versus 24 inches in an ISF. This change will make ISF systems 20% larger than current rule requires. What information supports increasing the system requirements by 20%? If the goal is to allow the same media (sand media) to be used in ISF systems then I recommend it be added as an option and keep the gradation in rule for a loading rate up to 1.2 gpd/ft2. The designer can then select the sizing and media based on the site and available media.

R317-4-6.14(C)3(c)i(2) – Recirculating gravel filter. Effective size of 1.5 to 5.0. With the uniformity coefficient of less than 2.0 the actual gradation will be very uniform. So, media in the 1.5 to 2.5 mm range will actually be the exact same or acceptable for RSF systems. I recommend that this range be changed to 2.5 to 5.0 as when the media is 1.5 to 2.5 it's actually an RSF system

by gradation definition. This becomes even more important considering the proposed increase of the loading rate on the sand media.

R317-4-6.14(C)3(c)ii – Maximum application loading rate for RGF. This statement increases the maximum loading rate from 5 gpd/ft2 to 15 gpd/ft2. This is a 300% increase in loading rate, which results in a 67% reduction in system size. What data has been used to support this increase?

For historical perspective, back in my research before the 2006 version of the rule when the draft language was being worked on I supported a loading rate of 7-8 gpd/ft2. This seemed logical based on information that I reviewed when I was part of COWP working on the draft at that time.

My experience is that engineers that have designed at this high of a loading rate report early clogging, increased maintenance, or early system failure. Media gradation for RSF and RGF systems has a typical porosity in the range of 0.3 to 0.4. The larger the media, the lower the porosity. For RGF media gradations the surface area and the porosity are likely both less as the media size increases. Media that uses higher loading rates (textile, foam, etc.) also has properties with higher porosity, usually greater than 0.8 or 0.9. Additional property differences includes increased surface area per cubic foot of media. The higher surface area and higher porosity are critical in supporting the higher loading rates.

I'm interested in what supporting information was submitted for this proposed change.

R317-4-6.14(C)4 – Pressurized absorption systems. I strongly support the addition of pressurized absorption systems as an option to be available in rule. I recommend that it be embraced for the potential advantages that are associated with the technology.

R317-4-6.14(C)4 – Pressurized absorption systems. These systems should be conventional, not alternative. They don't include treatment, reductions in area, siting considerations in difficult sites, or any other advantage over a conventional system. However, when utilized in both demand and timer dosed configurations they greatly improve system performance and expected design life of the absorption system. Maintenance for a pressurized distribution system isn't much more than for a typical gravity system or a system with an ejector pump or pump to d-box. The only difference is the need to flush the lateral lines periodically. Line flushing is simple. The technology is considered equal to conventional in many other jurisdictions. So I ask why is this technology classified as an alternative system? I recommend that it be accepted and as conventional.

R317-4-6.14(C)4(b) – Pressurized absorption system consideration criteria. I agree with this approach and recommend that the flow rate for considering pressurized distribution be changed from 3,000 gpd to systems with greater than 700 gpd. Nearly all single-family homes will have design flows less than 700 gpd. Larger systems and non-residential systems can greatly benefit from this preference. It's not a requirement, but a should or recommendation for consideration.

R317-4-6.14(C)4(b)ii – Pressurized distribution considerations based on soil type. This statement clarifies that Type 1 soils or percolation rates faster than 5 minutes per inch be considered for pressurized distribution. It's interesting to me that the percolation test is proposed to be optional with supporting information mentioning the inaccuracy of the test. Yet within this rule the percolation test results delineate differing deductions based on whether or not the test is faster than 10 mpi, 5 mpi, or 1 mpi. This means that the percolation test is to be used to break up Type 1 soils into at least 3 different sub groups each with implications as to suitability or technology to be utilized. Why not just refer to all Type 1 soils?

R317-4-6.14(C)4(c) – Pump system design requirements for pressurized distribution. See earlier comment regarding location of pump system requirements to be located in a single location. Appendix B?

R317-4-6.14(C)4(c)ii(1) – Pressurize piping requirements. Consider moving to Table 4 with other pipe specification requirements.

R317-4-6.14(C)4(c)ii(2) – Pressurized lateral ends. Recommend that if the squirt height does not reach an elevation above the finished grade, that the design include recommendations for line maintenance that will ensure long-term performance. These considerations could include pigging, jetting, brushing, etc. but should be addressed in the O&M manual.

R317-4-6.14(C)5 – Sand lined trenches. I support the addition of sand lined trenches within the rule.

R317-4-6.14(C)5 – Sand lined trenches. This technology is effectively a bottomless intermittent sand filter. Why are reductions in absorption area not included, as is the case for an ISF system? Additionally, why is the reduction for chambered trenches specifically prohibited for these systems? Again, as mentioned previously, area reductions appear to be subjective and not based on the science, hydraulic loading, dosing method, or other research or performance based approach. I recommend that area reductions be considered for this technology, similar to what is allowed for a packed bed media system.

R317-4-6.14(C)5(c)ix – Sand lined trench observation ports. Why is only 1 observation port required? Requirements for observation ports vary from 1, 2, or 3 based on the system technology. Wouldn't it make more sense to base it on the system size, overall length of trench or the number of trenches? Seems very arbitrary to me. The potential value of the observation ports will not be the same from technology to technology as proposed.

R317-4-7.1(A) – Deviate from approved plans. I support this requirement.

R317-4-7.1(D)3 – Cleanout requirement. This requirement should be located with the other cleanout requirements in section R317-4-6.5. I recommend it be moved accordingly.

R317-4-7.1(F)2(b)&(c) – D-box access. Paragraph (b) states that the box must be provided with a means of access. Paragraph (c) states that the top of the box shall be at least 6 inches below finished grade. Is access to the boxes being required or are the boxes required to be

buried? I recommend that access be provided to finish grade. Ponding up into the distribution piping could be observed in the boxes. Additionally, intermittent trench resting could be done as well as trench maintenance.

R317-8.1(A)1 – Watertight testing. What do the words "considering water absorption by the concrete" have to do with the method of testing a tank?

R317-4-8.1(F) – Final approval. Who prepares the as-built drawing? The installer, regulatory authority, the designer?

R317-4-10.5(A) – Holding tank capacity. States that the minimum capacity of underground holding tanks be 1,000 gallons. Above ground holding tanks are also mentioned within the section 10. What is the minimum capacity of above ground holding tanks? I recommend that the word "underground" be deleted.

R317-4-10.7(F) – Annual inspection required for all holding tanks. Who inspects the holding tanks every year? Will this be the LHD, DWQ, certified individuals?

R317-4-11.2(C) – Inspection frequency. States that non-domestic wastewater flows be inspected yearly. Is this for high strength systems, non-residential, or all commercial systems?

R317-4-11.5 – Distribution and drop box maintenance. States that d-boxes should be inspected and cleaned periodically. How? If they are buried a minimum of 6" below finished grade they will never be inspected or cleaned unless they fail to work properly or the absorption system fails. I support this recommendation, however it requires access to the boxes. Again, I recommend that access to d-boxes be required or clearly stated as preferred in the text of the rule.

R317-4-12 – Variance to design requirements. Allows a request for a variance for slopes or setbacks to dry wash, gully, or gulch. Doesn't allow any other reasons to apply for a variance. Section R317-4-12.3(E) clearly states that a local health department may not issue an approval or an operating permit for an onsite wastewater system that does not comply with all pertinent design requirements unless a variance has been approved. It also allows the local health department to not issue an approval or operating permit if a variance has been approved by the Executive Secretary or Board.

There are circumstances that arise where the requirements cannot be met as outlined within this rule. To limit the variance to setbacks to a dry wash, gully, gulch or slopes is very restrictive. What ends up happening is that approvals are issued when all of the requirements are not met because they make sense or are deemed to be the best possible solution for the problem, which violates the language as referenced in R317-4-12.3(E).

After a review of all of the requirements to justify a variance as outlined with section 12 it appears to me that if any other rule requirement cannot be met, but the designer can submit justification per this section and satisfy the requirements that a variance should be possible for the other requirements as well. I recommend that R317-4-12.1 be deleted and that any

requirement that cannot be met be open for a variance request, provided that the standards to justify the variance are met and deemed acceptable by the variance committee.

R317-4-12.3(E) – Variance language. I recommend that the option for a local health department to 'opt out' of an approval or operating permit be deleted. Delete "however a local health department is not required to issue an approval or operating permit based on the Executive Secretary's or Board's approval of a variance." If the variance standards can be demonstrated to the satisfaction of the variance committee the approval should be issued. The local health department shouldn't be able to deny this after justification is provided and approved.

Table 1

- Lot size requirements should be based on the ability to size and place a system on the lot. For any new subdivision there is language that allows this to be demonstrated prior to accepting the proposed plat. Increasing the lot sizes in this table will not fix the problems already approved. I recommend that lot sizes not be changed from existing rule requirements.
- Soil Type 5 is required to use Method 1 for lot size determination per footnote (c). Why? The packed bed media systems that are the only systems allowed for these systems also have reduced absorption area sizing. Again, the lot size determination language within subdivision approval has the language to demonstrate that the lots are large enough for the proposed development and the site conditions encountered. It allows the requirement of a design for the 'worst case' scenario anticipated. I recommend including a minimum lot size similar to existing rule at 20,000 square feet. Where lots are in Type 5 soils and will be using packed bed media systems, the lot size for private wells can also be smaller than current rule because the setback from the private well is reduced from 100 feet to 50 feet. A 1 acre lot is likely enough area. Lot sizing requirements should not be more than what is required to size a system or it becomes zoning.
- Footnote (f) states that soil Type 6 is unsuitable for any absorption system. This should be noted that it's a determination by rule definition. Technology exists to deal with soil Type 6 with the alternative technologies allowed in rule. If a site has Type 6 soils and can be developed successfully, why deem it unsuitable? Why not allow "out of the box" thinking to solve some of the difficult situations that arise on a regular basis? This could be done with appropriate engineering design or through the variance procedures.

Table 2

- Footnote (b) refers to section R317-4-6, which is a large section. Can this reference be more specific? What is it really supposed to refer to?

Table 3

- Gallons per day per bedroom. See previous comments on flow determination for single-family homes based on a bedroom count.
- Add footnote (c) that measured, actual flows are preferred to estimated flows per unit included within the table.

Table 4

- Effluent pipe and effluent sewer are interchanged in the table heading and footnotes. See previous comments on terminology selection of effluent sewer.

- Consider adding pipe specifications for pressurized pipe and force main piping within this table.

Table 5

- Footnote (d) allows area reductions for non-residential systems based on whether or not there is a garbage grinder (0.9 multiplier), any automatic sequence washers (0.7 multiplier), or if neither are installed (0.6 multiplier). Non-residential facilities, by definition will likely include non-domestic, or high strength facilities. Again, the area reductions proposed do not appear to be based on the science, organic loading, dosing method or research available on absorption system sizing. It seems likely that this will allow much higher organic loading rates on systems with much higher hydraulic loading rates. It's really not significantly different than existing rule. I just wonder what thought has been put into these sizing criteria.
- Footnote (h) allows percolation rates of 61 to 120 mpi for alternative packed bed and sand media systems. What other sand media systems are allowed where percolation rates are 61-90 mpi? Mounds and sand lined trenches are prohibited in text? What else is there?

Table 6

- Footnote (b) allows area reductions based on the presence of a garbage grinder or an automatic sequencing washer. See comment on same issue in Table 5
- Footnotes (c) & (d). The term non-single family is used for the same criteria as non-residential was used in Table 5. Select one term and stick with it throughout to reduce confusion.

Table 7

- Table 7.3 changes the existing requirement for the sample parameter of cBOD to BOD. cBOD is more accurate as it excludes BOD associated to nitrogen. I recommend changing this back to cBOD as is currently required in rule. A BOD test should be allowed in either event.

Appendix A

- 1.1(C)1 – Fiberglass tanks. Requires that fiberglass tanks be manufactured per IAPMO requirement Z1000-2007. This standard also includes tank construction requirements that are not required in other tanks built with concrete or polyethylene. Examples are two large openings, baffle, different scum requirement, etc. Through discussions with DWQ staff I have been told that the standard is required to ensure structural integrity of the tanks. Is there another standard that can be reference to meet the fiberglass structural requirements of concern? Alternatively, can a sentence be added that gives the manufacture the option to submit tank drawings and calculations to demonstrate acceptability of the tanks and achieve 'approved' status and be on the list? This would greatly reduce the need to approve tanks individually for each project.
- 1.4 – Liquid depth of tanks. States that the maximum liquid depth to be considered in calculating liquid volume required is 72 inches. This requirement has been in the industry for a long time and is intended to keep tanks longer than deep. A deep tank with minimal horizontal length does not perform as well in the separation of scum and sludge. However, it's not applicable to large tanks that are longer and have acceptable length to depth ratios. Larger tanks often have depths of 8', 10', or even 12'. Most

commonly though they are between 6' and 10'. I recommend that this statement be deleted. If there is concern regarding the potential of tanks proposed that are in effect pits, add language that provides a minimum length to depth ratio.
- 1.6(A) – Tank compartments. See comments in section R317-4-6.6(B)
- 1.6(C) – Recommend changing the minimum opening diameter for flow through a baffle be changed to 3", keeping the total area at 28.3 square inches.
- 1.7 – Scum storage. Another example of difference between rule language on tanks in general and the IAPMO spec referred to, which requires only 10% for scum storage.

Appendix B
- In general, consider consolidating requirements for pumping systems within this appendix.
- 1.1(B) – Electrical disconnects. Language appears to be referring to splices within a junction box. Is that correct? Or are actual electrical disconnects required for all installations?
- 1.2(A) – Requires alarm for either pump in a duplex pump package. Good idea, but also increases the cost of the panel by requiring a current sensor or other method to indicate alarm. Just having the duplex pump provides redundancy and added protection. There are no requirements mentioned within the entire rule text that states when a duplex pump package is required. However, here it adds additional requirement in the event it's used. Should be a recommendation, not a requirement. I recommend changing 'shall' to 'should'.
- 1.2(B) – Requires controls to shut down preceding pumps in the event an alarm conditions exists down stream. Why? Is there also a way to shut off gravity flow into the system in front of that? I recommend deleting this statement.
- 1.2(C)2 – "The control panel shall be installed within sight of the access risers." It may not always be possible or even appropriate to install the panel within sight. I recommend that 'shall' be changed to 'should'. Might even consider requiring appropriate electrical disconnects with "lock out/tag out" capability if needed when not located within sight, per electrical code requirements.

Appendix E
- 1.1(B) – Septic tank inspection recommended yearly. This statement conflicts with the guidance in section R317-4-11 that states every 3 years, 2 years, or yearly depending on system type and flow rate.
- 1.2(A) – recommends that any measurable sludge or scum in other tanks be removed. It's not uncommon to be able to measure sludge in a recirculation tank or even in a dose tank. Just because you can measure the tank doesn't necessarily mean it needs to be removed. Recommend changing the language to read "Any sludge or scum in other tanks should be removed if accumulations are likely to interfere with the proper operation of the tank"
- 1.2(B) – Sentence is redundant to statement in 1.1(G)